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Lower Mill Creek Stream Restoration Project

Environmental Assessment

Clearwater Ranger District,
Nez Perce National Forest

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Nez Perce National Forest
Northern Region, USDA Forest Service

June 2010

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1. Purpose of and Need for Action

The Forest Service has prepared this environmental assessment (EA) in accordance with the National Environmental Protection Act (NEPA) and other relevant Federal and State laws and regulations. This EA discloses the project's foreseeable environmental effects for consideration in determining whether or not to prepare an environmental impact statement.

Additional documentation, including more detailed analyses of project area resources, may be found in the project planning record located at the Clearwater Ranger District Office in Grangeville, Idaho.

A. Introduction

The Clearwater Ranger District of the Nez Perce National Forest proposes to restore a 520-foot section of Mill Creek to a stable condition, stabilize landslide material to reduce sedimentation to Mill Creek, and realign and repair a 720-foot road section that was damaged during flooding in 2008.

The Lower Mill Creek Project Area (or project area) is approximately 3 acres, and is located within the Mill Creek Watershed, a tributary of the South Fork Clearwater River between Grangeville and Elk City, Idaho. The project area is located in section 34, T29N, R4E, BM. The project is scheduled for implementation in the winter of 2010–2011.

B. Background

In the spring of 2008, a flash flood caused a culvert to plug on Big Canyon Creek at milepost 4.9 on the Hungry Ridge Road 309. The culvert plugging then lead to further flooding and subsequent landslide failures at Big Canyon Creek and two locations down gradient (mileposts 4.4 and 3.8). This landslide material then entered the Mill Creek stream channel at three sites (see appendix A for a map with these locations). Near milepost 1.3 on Road 309 it diverted the stream, which in turn damaged the road. The photograph on the next page shows the landslide material in the stream channel with the stream running across the road shortly after the landslide. Emergency measures were taken in the spring of 2008 to stabilize the road, create drainage through plugged culverts, and remove some of the landslide material for initial stabilization. The stream channel remains in a degraded state from the flood damage.

C. Purpose and Need

The purpose of the project is to restore the affected 520 feet of Mill Creek to a stable condition and to repair 700 feet of the 309 Road to provide safe public access. Mill Creek is currently in a degraded state near milepost 1.3 on Road 309 due to landslide material spilling into the stream and forcing the stream across the road. This is a continuing source of sediment for the stream, negatively affecting fish habitat. This project would stabilize the stream channel, reduce sediment sources, improve fish habitat, re-establish riparian vegetation, and repair the road segment.

Mill Creek and the 309 Road shortly after the landslide at milepost 1.3

D. Modified Proposed Action

The modified proposed action would involve moving 520 feet of Mill Creek approximately 10 to 20 feet away from Road 309, reconstructing the channel to the desired slope and sinuosity, removing and stabilizing landslide material, and realigning and repairing 700 linear feet of Road 309.

Some of the primary elements of the stream reconstruction would include:

- Design the channel with floodplain to contain a 100-year recurrence streamflow event.
- Remove excess landslide material from the site to accommodate the new stream channel location and stabilize the remaining landslide material.
- Create a terrace between the stream channel and the remaining landslide material.
- Fell approximately 12 trees in the construction zone for safety reasons and for construction clearance (the majority of these trees have died from the landslide).
- Construct grade-control structures in the stream channel to maintain the objective slope and sinuosity.
- Two options for timing of instream work should be considered—a winter work window during low stream flow period (approximately December to the end of March) to ensure minimum streamflows and minimize potential detrimental effects on fisheries, or a summer work window between August 15 and September 30 to reduce potential risks to juvenile steelhead trout and

reduce the likelihood of spring/summer Chinook salmon pre-spawning migrations through the instream site.

- Dewater the stream channel prior to instream construction activities, and send diverted water down the western ditchline of Road 309. The instream flow diversion will achieve this objective. A screen across the inlet of the diversion (and outlet) will eliminate risk of fish entering the diverted stream flow path. A diverted flow and subsequent dry channel conditions will prevent fish from moving upstream into the dewatered channel construction site.
- Use all applicable project design and mitigation measures for wet weather and/or high flow operations if temperatures warm during the construction period.
- Retain public access during construction so as to not disrupt recreation.

Excess fill material from the construction would be removed from the site and either placed near milepost 0.5 on Road 9408 or removed from National Forest System lands. Snowplowing for access would be required on roughly 5 miles of road if the winter timing window is used.

A revegetation plan would be developed to help stabilize bare soils, reduce sediment sources, and return the area to a natural vegetative state. This plan would include revegetation of the landslide material, 520-foot construction zone, floodplains, stream banks, terraces, and the adjacent dispersed camping/parking area, which would be used for staging vehicles and storing fill material, as well as any other areas downstream of the project area as deemed necessary.

As part of the project, approximately half of the adjacent flat, which is currently used for temporary storage of road waste and ditch material, would be reshaped and rehabilitated to a more natural vegetative state. The opportunity for dispersed camping/parking in that area would be retained. Appropriately-sized barrier rocks would be placed to define the dispersed site and meet Forest Plan standards.

E. Desired Condition

Mill Creek is proposed critical habitat for bull trout and designated critical habitat for steelhead. Beneficial uses for Mill Creek as assigned by the Idaho Department of Environmental Quality (IDEQ) include cold water aquatic life and primary or secondary contact recreation. The desired condition is that Mill Creek provides viable critical habitat for bull trout and steelhead and also meets or exceeds all of the beneficial uses listed above. This complies with Forest Plan direction, as detailed in following section I(1) for standards 19, 6, and 9.

It is desirable to establish and maintain a thriving riparian zone and vegetative community in the affected 520 foot of stream channel. This complies with Forest Plan direction, as detailed in section I(1) for standard 8.

It is also desirable for the 309 Road to remain in a safe, drivable condition. This complies with Forest Plan direction, as detailed in section I(1) for standard 5.

F. Existing Condition

In the affected area, Mill Creek is in a highly degraded state. Currently, the stream segment is straight and incised. The streambanks on the east side of the stream are unstable and eroding, loading the stream with sediment. Aquatic habitat in this stream section is adversely impacted by these conditions and currently limited.

The riparian vegetation in this section has been either destroyed or adversely affected by the accumulation of landslide material. This is one of the key elements creating degraded stream channel conditions.

Proposed Mill Creek restoration stretch with landslide material, the 309 Road, and dead conifers

Before the landslides in 2008, Mill Creek was listed by the State for exceeding standards for sediment and temperature. The landslide, flooding, and stream degradation have created worse conditions than when the 2008 report was issued. Mill Creek is also listed in section 4a of the Idaho Integrated Report and included in the South Fork Clearwater Subbasin Assessment and Total Maximum Daily Load.

The 309 Road is currently in danger of being washed out again if there is another large flood in Mill Creek. Rip-rap has been placed along the western streambank to help stabilize and protect the road. However, there are road sections downstream that are in danger of being undermined by the stream.

The photo above shows the current conditions of Mill Creek with the lack of riparian vegetation, placed rip-rap, and landslide material in the foreground and to the right. This picture also shows several of the dead conifers which would be removed during construction and retained in the riparian zone or used to construct in-stream structures. The 309 Road is also in the background of the picture, adjacent to the creek.

G. Public Involvement

The proposal was listed in the Forest Schedule of Proposed Actions (SOPA) on November 10, 2009. On January 8, 2010, a scoping letter describing the proposed action, location, and purpose and need was sent to the Nez Perce Tribe and all interested individuals, businesses, organizations, and agencies. A legal notice and request for public comment appeared in the *Lewiston Tribune* on January 11, 2010. Comments

were received from two environmental groups, two regulatory agencies, and one individual, and were considered in the analysis (see the following section).

H. Environmental Issues

The proposed action was developed to meet the purpose and need for action. The interdisciplinary team designed the project to minimize effects on resources; this caused all issues to be categorized as insignificant for this project. Analysis of public and internal comments identified no significant issues; however, some commenters did identify concerns that deserved consideration. These concerns were addressed through project design and incorporation of appropriate resource protection measures. Issues brought forth by commenters were grouped into the categories below. All comments and their responses are located in the project file.

1. Issues Addressed Through Alternative Development

Two commenters questioned the need to move the creek channel. Both commenters felt that moving the creek further from the road instead of moving the road further from the creek would not restore the creek from its degraded state or alleviate the current sedimentation problems in the creek. Moving the road away from the creek was considered, but not analyzed in detail.

Two commenters recommended road re-routes through the upper portions of the Mill Creek Watershed. This alternative was considered, but not analyzed in detail.

2. Issues Addressed Through Standard Procedure or Compliance with State Regulations

A commenter asked for more detailed maps and photos in order to clarify the issues. Maps and photos are included in this document.

A commenter reminded the Forest Service that activities creating non-point source pollutants in listed streams require a monitoring plan to be submitted to the IDEQ and reviewed for compliance. A monitoring plan was developed to address this (see appendix D).

A commenter reminded the Forest Service that the aforementioned monitoring plan needs to determine the effectiveness of best management practices (BMPs) in protecting beneficial water uses, and provide process for modifying BMPs to protect beneficial uses. This is part of the monitoring plan; BMPs, and other mitigation measures are included in this document.

A commenter reminded the Forest Service that they should coordinate and consult with U.S. Fish and Wildlife Service (USFWS) and NOAA-Fisheries to insure appropriate design features, mitigation, and project timing are used to minimize effects to aquatic species. This consultation has been completed and documentation is found in the project record.

3. Issues Addressed Through the Issues and Effects Portions of the Analysis

A commenter reminded the Forest Service that activities are proposed in a stream listed in section 4a of the Idaho Integrated Report. The effects to this stream were taken into account in the environmental effects analysis documented in this EA.

An individual commented on the importance of the 309 Road for recreation access. The effects of this project on recreation use were taken into account in the environmental effects analysis documented in this EA.

4. Issues Outside the Scope of This Project

A commenter recommended that the Forest Service conduct a road analysis to identify roads in the project area for decommissioning. This does not achieve the purpose and need of this project which is to restore the stream from effects of the landslide.

I. Regulatory Framework and Consistency

The Lower Mill Creek Stream Restoration Project analysis and documentation of effects is consistent with direction described below.

1. Forest Plan Direction

The Nez Perce Forest Plan provides direction for wildlife and fish with the following Forest-wide standards that would apply for this proposal (USDA Forest Service 1987, page II-19):

> 19. Restore presently degraded fish habitat to meet the fish/water quality objectives established in this Forest Plan (see appendix A of the Forest Plan).

The Nez Perce Forest Plan also provides direction for roads and trails with the following Forest-wide standards that would apply for this proposal (USDA Forest Service 1987, page II-25):

> 5. Maintain access facilities to the level commensurate with use, user type, user safety, and facility-resource protection.
>
> 6. Plan, design, and manage all access to meet land and resource management objectives, meet the State Water Quality Standards, and meet BMPs.
>
> 8. Minimize impacts from construction in identified key riparian and wildlife areas. Develop rehabilitation plans for existing access facilities that are producing significant impacts on riparian-dependent resources.
>
> 9. Design all proposed road systems to mitigate at least 70 percent of the sediment predicted. Utilize proven mitigation procedures in the design and construction of roads to meet up to 90 percent of the sediment predicted, where needed to meet resource management objectives.

The Nez Perce Forest Plan also provides direction for riparian areas with the following Forest-wide standards that would apply for this proposal (USDA Forest Service 1987, page II-22):

> 1. Allow no management practices in riparian areas that will cause detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment that seriously and adversely affect water conditions and fish habitat.
>
> 2. Give preferential consideration to riparian-area-dependent resources in cases of unresolvable conflict (resources such as fish, certain wildlife, certain water-dependent vegetation, and water are totally dependent upon riparian areas).
>
> 5. Manage riparian areas to maintain cover and security for riparian-dependent species with emphasis on maintaining and enhancing habitats for threatened and endangered species.

2. Watershed and Fisheries Resources Regulatory Framework

All Federal and State laws and regulations applicable to water quality would be applied to the Lower Mill Creek Stream Restoration Project, including 36 CFR 219.27, the Clean Water Act, and Idaho State Water Quality Standards, Idaho Forest Practices Act, Idaho Stream Channel Protection Act, and BMPs. In addition, laws and regulations require the maintenance of viable populations of aquatic species including the National Forest Management Act (36 CFR 219.19), subsequent Forest Service direction (Fish and Wildlife Policy, 9500-4) and Forest Service Manual direction (FSM 2470, 2600). A comprehensive list of applicable watershed regulations is found in appendix C.

3. Endangered Species Act

The proposed action complies with the Endangered Species Act. A biological assessment and a biological evaluation were completed for fish for this project, documenting the project "may affect/likely to adversely affect" steelhead and bull trout fish species. To minimize the risk and likelihood of affecting ESA-listed fish species and reduce the potential effects, flow diversion as described occurring over 48 hours would encourage those fish present to leave the dewatering stream channel. Monitoring for isolated fish during dewatering, and relocating fish out of the project area as needed prior to instream channel construction implementation, would also reduce risk to individual fish. Placement of a barrier to keep fish from moving back into the stream channel construction zone would further reduce risks. Sensitive plant species would not be affected.

4. National Historic Preservation Act of 1966, as Amended

Per stipulation V(B) of the Programmatic Agreement Concerning the Management of Cultural Resources on Northern Region National Forests, the Forest archaeologist has made a "No Historic Properties Affected" determination for this project.

Scoping material for this project was sent to the Nez Perce Tribal Executive Committee. Additionally, Forest Service and Nez Perce Tribe professional staffs, as well as Forest Service line officers and Nez Perce Tribe elected officials, meet regularly about various projects including the Lower Mill Creek Stream Restoration Project to ensure Treaty and religious cultural rights and practices are protected. No objection concerning the management of historic properties has been offered by the Nez Perce Tribe for this project.

2. Alternatives

A. Alternatives/Alternative Development Process

This section describes and compares the alternatives considered during this analysis. Section 2 defines the issues and provides a basis for choice among options by the decision maker and the public (40 CFR 1502.14). The important difference between alternatives is based upon the driving (or key) issue that is emphasized in each. Alternatives were developed based upon Forest Plan objectives, national and regional direction and policy, existing conditions, and environmental issues.

1. Alternative 1 (No Action)

This alternative provides a baseline for comparison of environmental consequences of the proposed action to the existing condition, and is a management option that could be selected by the responsible official.

Under the no-action alternative, there would be no moving and reconstructing of the stream channel to the desired slope and sinuosity, removing and stabilizing landslide material, or realigning and repairing the 309 Road.

2. Alternative 2 (Proposed Action)

Under this alternative, the Forest Service would meet the project purpose and need by implementing the activities listed in section 1(D) of this document. This alternative would involve moving 520 feet of Mill Creek approximately 10 to 20 feet away from Road 309, reconstructing the channel to the desired slope and sinuosity, removing and stabilizing landslide material, and realigning and repairing 700 linear feet of Road 309.

This alternative proposes to design the channel to withstand a 100-year flood event, remove and stabilize landslide material, create a stable terrace between the stream and landslide material, and construct grade control structures to maintain the desired slope and sinuosity of the channel. This alternative would also include a re-vegetation plan to help stabilize sediment.

B. Project Design and Mitigation Measures

Appendix B of this document contains a table with a complete list of project design measures and project mitigation measures submitted by each resource specialist. When implemented, the project design measures would ensure that IDEQ water quality standards would be met.

C. Alternatives Considered but Not Analyzed in Detail

"Consider moving the 309 Road as far away from the stream as possible, into the adjacent hillside."

Commenters recommended moving the 309 Road to accommodate the stream instead of moving the stream to accommodate the road. This alternative was considered, but it was determined that the valley was too narrow to allow the road to be moved further away from the creek. A horizontal alignment shift of only 2 to 4 feet would be possible without excavating into the existing hillslope. Shifting the road into the hillslope further would generate considerable additional excavation. Also, the activity would still require channel excavation to return the channel to a desirable configuration.

"Consider rerouting traffic and decommissioning 309 Road."

Two commenters suggested using alternative access routes to provide access to the 309 Road and decommissioning the lower portion of the 309 Road adjacent to Mill Creek. The commenters reasoned it would be more environmentally sound to use an alternative route for traffic and decommission the road instead of performing stream restoration to save the existing road.

An alternative connecting to the Hungry Ridge Road from an existing spur off of Road 279 was considered, but the cost of constructing additional road segments for public access would be in excess of $800,000. Also, the environmental consequences of building new road on steep hill sides in the upper watershed of Mill Creek is potentially more severe than maintaining the existing road location. This road re-route would involve constructing roads on 60 percent sideslopes with a 6 percent grade and eight stream crossings. This would create the potential for much more sediment loading from upper watershed locations into Mill Creek than is currently occurring.

Historically, road access to Hungry Ridge was available via another route, and one commenter made a suggestion to consider this route. This route was abandoned in favor of the current location in 1965 because the route was excessively steep (approximately 10 percent gradient), crosses several streams, including near the mouth of Big Canyon Creek, was very narrow, and located on 60 percent sideslopes. Reconstruction sufficient to provide width for this route would potentially have more severe environmental consequences than the existing road location, and the serviceability of access to Hungry Ridge would be substantially reduced due to roadway gradients. This route presented continual maintenance and sediment problems and was closed when the current road location became available for access.

D. Alternative Comparison

Table 2-1 presents a comparison of the proposed action to the purpose and need based on indicators established to measure responsiveness.

Each alternative was also evaluated for its effects on the resources based on the key issue that drove the development of the alternative. Issue indicators are used to measure the effect of each alternative on the resources emphasized by the issue. Table 2-2 provides a comparison of the alternatives in relation to the issues described in section 1.

Table 2-1. Alternative comparison to purpose and need

	Alternative 1 (No Action)	Alternative 2 (Proposed Action)
Restore the affected 520 feet of Mill Creek to a stable condition		
Indicator: **Length of Mill Creek restored to enhance fisheries habitat and stabilize the stream channel (feet)**	0	520
Repair the 309 Road to provide safe public access		
Indicator: **Length of road repaired in high risk area for washout (feet)**	0	700

Table 2-2. Alternative comparison by issue

Resource Issue ***Issue Indicator***	**Alternative 1**	**Alternative 2**
Water Quality		
Sediment delivery	Direct sediment delivery to Mill Creek from disturbed area remains.	Direct sediment delivery from disturbed area substantially reduced.
Bank stability	Streambanks remain unstable and a source of sediment.	Streambanks are stabilized.
Fisheries		
Degraded fisheries Habitat	Fisheries habitat remains degraded and the timeframe to improving channel conditions through natural flow and channel processes is greatly increased.	Improved fisheries habitat.
Soils		
Surface erosion potential ***Degraded riparian zone***	No change.	Long-term improvement because of stabilized soils and growth of viable riparian community.
Wildlife		
Bald eagle	No change.	No change.
Fisher	No change.	Beneficial.
Harlequin duck	No change.	Unlikely construction would cause them to avoid the watershed.
Western (boreal) toad	Currently unsuitable for habitation.	Would restore cover and suitable western toad habitat.
Recreation		
Unstable access road	Road access remains unstable.	309 Road is repaired.

3. Environmental Impacts of the Proposed Action

This section provides a summary of the environmental impacts of the alternatives considered in detail. It provides the necessary information to determine whether or not to prepare an environmental impact statement. More details regarding the affected environment, conclusions about potential effects, and applicable Forest Plan and regulatory direction are available in the specialist reports for each resource and other supporting documentation cited in those reports. This project is consistent with the National Forest Management Act, 16 U.S.C. 1604 (g)(1), and with the management direction in the Nez Perce National Forest Management Plan (USDA Forest Service 1987).

A. Cultural Resources

Presently, there are no documented historic properties within the boundaries of the analysis area. Cultural resource inventory was performed in 2009 in support of the current proposed action. Approximately 5 acres were examined at that time. No known National Register of Historic Places (NRHP)-eligible cultural resource properties are located within the analysis area.

Per stipulation V(B) of the Programmatic Agreement Concerning the Management of Cultural Resources on Northern Region National Forests, the Forest archaeologist has made a "No Historic Properties Affected" determination for this project.

B. Rare Plants

1. Affected Environment

Rare plant species that could occur in lower Mill Creek are dependent upon late-seral communities that were eliminated by the large landslide and extensive flooding. There are, therefore, no rare plant species in the project area.

2. Environmental Consequences

Alternative 1 (No Action)

Direct and Indirect Effects. The no-action alternative would not affect rare plant species. However, without the stabilizing efforts, the slide area would remain unstable, making it slower for suitable habitats to be restored to the area in the long run. Also, the ongoing instability would support conditions suitable for invasive plant species, which could further delay vegetative recovery of the area.

Alternative 2 (Proposed Action)

Direct and Indirect Effects. The proposed action would not affect rare plant species. However, the effects of the proposed work would contribute to the stabilization of the site, which may have an indirect effect of increasing the likelihood of suitable habits being restored to the area in the long term.

Cumulative Effects

This project would have no affect on rare plant species, thus there would be no potential for cumulative effects.

C. Wildlife

The USFWS does not list any threatened or endangered wildlife species in the Clearwater River basin of the Nez Perce National Forest. Per the Northern Rockies Lynx Management Direction Record of

Decision (March 2007), the Nez Perce National Forest is identified as "unoccupied secondary" Canada lynx habitat. The elevation at the project site is considered too low to be included in any mapped lynx analysis unit.

1. Affected Environment

Bald Eagle: The lower Mill Creek project site is relatively low elevation and in close proximity to the South Fork Clearwater River and State Highway 14. Because of elevation proximity to the river, the project could receive intermittent, but infrequent, over-flights by wintering bald eagle. No roost trees are known or suspected in the area.

Fisher: Densely forested riparian habitats at this elevation are expected to serve as travel and winter foraging habitats for fisher. The project site, however, was denuded by the 2008 flood and landslides. Fisher use in this area, regardless of current habitat conditions, would be expected to be incidental due to the proximity to State Highway 14, the relatively low elevation, and lack of suitable on-site fisher travel/foraging habitat.

Harlequin Duck: The Mill Creek drainage is large, with some reaches isolated from human disturbance and supporting nesting and brood rearing habitats characteristically occupied by the wary, secretive Harlequin duck. The lower reaches are likely unsuitable for nesting due to human disturbance. The project site, due to a combination of human access and the flood, lacks sufficient vegetation to provide cover or seclusion for Harlequin duck habitation. It is feasible however, that Harlequin duck adults and young could pass through the project site to/from nesting habitat in the upper reaches of the watershed.

Western (Boreal) Toad: Due to the flood, the project site lacks hiding cover provided by vegetation and large, down wood. Because of the lack of cover, this project site in its current condition is considered unsuitable for habitation.

Elk, Flammulated Owl, Moose, Northern Goshawk, Pileated Woodpecker, Pygmy Nuthatch, Ringneck Snake, and White-Headed Woodpecker: Habitat for these species occurs in the vicinity of the project site. The planned actions would neither affect the current habitat attributes nor cause disturbance affecting habitation or reproduction.

2. Environmental Consequences

Alternative 1 (No Action)

Direct and Indirect Effects. This alternative proposes no action and would maintain existing conditions in the analysis area. Additional traffic in the area and potential disturbance resulting from project implementation would not occur.

Alternative 2 (Proposed Action)

Direct and Indirect Effects.

Bald Eagle: Based on historic eagle wintering activities along major rivers paralleled by State and Federal highways, the planned activities would have no direct, indirect, or cumulative effects to bald eagle or bald eagle habitat.

Fisher: The planned actions are not expected to have direct effects on fishers or fisher habitat. Ultimately, however, relocating the stream channel away from the Mill Creek Road and restoring riparian habitat are expected to benefit fisher.

Harlequin Duck: Stream channel reconstruction would have no effect on this species. Likewise, while these wary birds may travel through the project area, it is unlikely the planned road reconstruction would cause them to avoid the watershed.

Western (Boreal) Toad: The planned actions would restore both cover and suitable western toad habitat.

Elk, Flammulated Owl, Moose, Northern Goshawk, Pileated Woodpecker, Pygmy Nuthatch, Ringneck Snake, and White-Headed Woodpecker: The planned actions would neither affect the current habitat attributes nor cause disturbance affecting habitation or reproduction.

Cumulative Effects

The cumulative effects of the planned actions would benefit fisher and its habitat in the long term.

D. Recreation

1. Affected Environment

Road 309 is used extensively by recreationists to access Hungry Ridge, Adams Camp, and the South Fork Clearwater River. Road 309 is also used to access trails; developed and undeveloped recreation sites; fishing, hunting, and winter travel opportunities; and is used by permitted outfitters and grazing permittees.

2. Environmental Consequences

The proposed action alternative would not have direct or indirect effects because the road would remain open to recreationists during the construction phase. There are no cumulative effects for alternative 1 or 2. Road 309 would remain open and not affect recreationists. During the winter timing window, recreation use would be low in the project area.

E. Transportation

1. Affected Environment

Transportation analysis focuses on the needs and impacts on the transportation infrastructure associated with the proposed action and alternatives. In this case, it is primarily the Mill Creek Road (NFSR 309) from the South Fork Clearwater River to Hungry Ridge that would be affected.

Hungry Ridge Road provides motor vehicle access from the South Fork Clearwater River to Hungry Ridge. This road is classified as a "collector" road and provides access for vehicles up to and including lowboys. It provides general administrative, recreation, and private lands access. It is a primary route of access to National Forest System lands.

2. Environmental Consequences

Alternative 1 (No Action)

Direct and Indirect Effects. Direct effects to the roadway are limited. Roadway deficiencies, such as the adjacent damaged ditch, would remain. Traffic would continue to use the roadway with only slight reduction in serviceability of the road. The roadway would continue to be maintained in its current condition.

There is increased risk of damage to the roadway from flooding and scour if the stream channel is not treated to improve hydrologic condition and if the areas adjacent to the roadway shoulder are not treated to complement the stream hydrology. Future road restrictions may be necessary should damage occur.

Alternative 2 (Proposed Action)

Direct and Indirect Effects. Direct effects include minor alignment and grade adjustments as well as treatments adjacent to the roadway shoulders to complement the stream hydrology. The ability of the roadway to provide for the passage of traffic would be restored to levels existing prior to the flood event.

The potential for damage to the roadway as a result of stream flooding would be reduced from current levels. The potential for roadway restrictions due to flood events would be lessened compared to the no-action alternative.

Cumulative Effects

There are no cumulative effects.

F. Watershed

1. Affected Environment

Soils: The existing soil substrate consists primarily of cobble-sized material, sand, and gravels that have eroded downslope from the landslide activity. This material is becoming devoid of fines because they have eroded out and into the stream channel and continue to do so. This has left a very well-drained, coarse substrate. In spite of its coarse nature, this substrate remains viable for revegetation because of the high effective precipitation in the valley bottom and the relatively high ground water level.

Road Conditions: One of the primary sources of sediment for Mill Creek is the 309 Road which runs adjacent to Mill Creek through the valley bottom. Through the section of road to be repaired, there is a graveled surface with and the road is in-sloped with a ditch. The ditch is a primary sediment source for Mill Creek as it continues to erode. In many places, the ditch is also the toe of the hill slope; the unstable and eroding toe has degrading influence upslope. Soil continues, therefore, to erode from the hillslope into the ditch and then into Mill Creek.

Riparian Vegetation: Riparian vegetation along the affected reach was mostly destroyed from the landslide. Reference reaches along Mill Creek show a diverse shrub and tree plant community. An intact riparian vegetation community would contribute to bank and floodplain stability as well as sediment filtration. The affected area does show some amount of shrub regeneration and seed source. The parking area just upstream of the landslide has the potential for vigorous riparian re-vegetation, but currently is heavily compacted and has restricted growth.

Watersheds: The Mill Creek Watershed has four 6th Hydrologic Unit Code (HUC) Nez Perce Forest Plan prescription subwatersheds. These prescription watersheds have water quality standards that are required to meet Forest Plan directions. Table C-1 of appendix C (this document) contains water quality objectives for each of the watersheds. The HUC numbers in appendix C reflect the numbering system at the time the Forest Plan was amended in 1991. Appendix C also contains all relevant Nez Perce Forest Plan guidance, laws, and regulations adhered to for this project.

The four mapped 6th HUCs include: Upper Mill Creek (HUC 170603050112), Merton Creek (HUC 170603050114), Lower Mill Creek (HUC 170603050116), and Big Canyon Creek (HUC 170603050118). The entire watershed drains steep mountain slopes from an area of 37 square miles. Mill Creek is the

main drainage, running approximately 18 miles from its headwaters at the Gospel Hump Wilderness Mountains to its mouth at the South Fork Clearwater River. Elevations in the watershed range from 5,600 to 2,600 feet above sea level.

Equivalent Clearcut Area (ECA) Results: While often used as an indicator for water yield and cumulative effects analysis, ECA can be used in this analysis to characterize watershed conditions. ECA for the four 6th HUC watersheds varies from 7.2 to 16.8 percent. ECA for the entire Mill Creek watershed is 8.6 percent. (ECA is considered to be of concern when it exceeds 15 to 20 percent.) Hydrologists of the Northern Region have commonly used an ECA value of 20 to 30 percent within a watershed as a 'yellow flag' warning of possible deleterious effects. It can therefore be assumed that water yield has not been significantly impacted in the Mill Creek Watershed.

Channel Condition: A modified Rosgen (1996) level II stream classification was used to assess the current channel condition. This included field observations of entrenchment ratios, width-to-depth ratios, bankfull measurements, and substrate information. Modification of the channel morphology within the project area, mainly from the construction of the 309 Road, has created entrenched conditions with little available floodplain. The disturbance has reduced entrenchment ratios from historic levels of about 5:1 to the current conditions of 1:1 (Bair 2008).

Furthermore, large-scale landslides such as the one in 2008 have contributed to constrictions in the stream channel. The constriction of the stream channel accelerates flow velocities and concentrates the stream's energy on the streambed, increasing the size of the channel substrate and degrading the channel. Flood flows are not able to spread out onto a floodplain, which would reduce flow velocities and deposit nutrients and fine sediments.

Field measures of bankfull width-to-depth (w/d) ratios were conducted for the project area reach and a reference reach located 300 feet upstream. The ratios collected were 8.6 and 10, respectively. These values are typical of channels with low w/d ratios which tend to be narrow and deep. The small difference in the values indicates no shift in channel stability caused by the landslide. Nevertheless, from a hydrological perspective, low w/d ratios are indicative of a channel that cannot access its floodplain to dissipate excess energy. As a result, stream energy is retained in the stream channel which increases streambank erosion, resulting in unstable streambanks. This is of particular concern where there is inadequate vegetative cover to protect streambanks during high flows and upland species in the riparian area.

Surface Water: Spring runoff in Mill Creek generally begins in early April. High streamflows are controlled primarily by snowmelt runoff and rainfall runoff, with a snowmelt peak occurring in late May and peak flows from rain-on-snow events occurring concurrently. Low winter flows generally occur from December through April, with the lowest flows occurring in December.

No stream gauge data exist for Mill Creek. About 10 years of historic flow data and flood recurrence data are available for a nearby gauge on Johns Creek. Although the adjacent Johns Creek Watershed is considerably bigger, the two share similar hydrological processes. Data derived from the Johns Creek gauge was primarily used to determine the temporal variability of precipitation as it influences runoff, as well as a reference for the validation of the USGS regression equations used in the streamflow model (U.S. Geological Survey 2010).

The mean annual discharge estimate in Mill Creek (calculated by averaging the monthly flows from table 3-1) is approximately 32 cubic feet per second (cfs). Bankfull flow estimates for Mill Creek resulted in approximately 267 cfs, based on flood frequency analysis of the 1.5-year flow. For design purposes, the

bankfull flow on Mill Creek at the project area is estimated to be in the range of 230 to 250 cfs. The 100-year flow on Mill Creek is estimated to be 1,080 cfs.

Table 3-1. Mill Creek monthly flows from USGS Streamstats model (50% exceedance)

Month	Flow (cfs)	Estimation Error (%)
January	11.10	50
February	15.40	43
March	26.80	44
April	100.00	42
May	125.00	56
June	52.10	65
July	14.10	54
August	6.42	78
September	5.62	73
October	6.92	60
November	8.65	51
December	10.50	50

Water Quality and Turbidity: Mill Creek is listed in the IDEQ's current 303(d)/305(b) Integrated Report (DEQ 2008) under section 4a: "Waterbodies with approved TMDLs." The South Fork Clearwater River Subbasin Assessment and TMDLs (IDEQ et al. 2003) address water quality-limited streams listed under section 303(d) of the Clean Water Act. Total maximum daily loads (TMDLs) were developed for the South Fork Clearwater River for water temperature and sediment. The water temperature TMDL calls for canopy density or shade targets on a stream reach basis throughout the subbasin, including Mill Creek.

For sediment, the TMDL targets a 25 percent reduction in human-caused sediment to the South Fork Clearwater River. No specific targets were set for tributaries, but it was recognized that much of the sediment yield reduction would need to occur in the tributaries.

The Idaho State Water Quality Standards do not specifically designate beneficial uses in Mill Creek. As a 'Nondesignated Surface Water', standards for cold water aquatic life and primary or secondary contact recreation apply. In Mill Creek, water quality criteria that may be affected by this project include water temperature and turbidity.

- *Sediment:* Sediment must not contain quantities that impair beneficial uses. Determination of impairment shall be based on water quality monitoring and surveillance.
- *Water Temperature:* Waters designated for cold-water biota are not to exceed 22°C, with the maximum daily average no greater than 19°C. Waters designated for salmonid spawning are not to exceed 13°C, with the maximum daily average no greater than 9°C.
- *Turbidity:* Turbidity is not to exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days.

To ensure that State water quality standards are met, a monitoring plan will be followed (this plan is in appendix D).

Sedimentation: Sediment yield is measured in tons, but more importantly, as a change in the natural conditions, or 'percent over base' conditions. The recurrence of activities can also affect the persistence

of sediments in the system, and so the number of large activities, or 'sediment entries' in a decade are examined. The Nez Perce Forest Plan includes an objective describing both of these water quality indicators. See table C-1 of appendix C for a complete list of objective values.

Sediment for the analysis area was calculated using NEZSED, a version of the R1/R4 sediment model refined to the conditions of the Nez Perce National Forest. Results of the NEZSED model show that management activities across the entire Mill Creek Watershed were delivering sediment at about 8 percent over baseline (or natural conditions). The individual 6th HUCs ranged in sediment delivery over baseline from 5.2 to 15.7 percent. As listed in table C-1 of appendix C, the maximum percent sediment delivery over baseline to meet Forest Plan standard for water quality and fisheries is 35 percent. Therefore, there has been very little increase in sedimentation into Mill Creek from management and the amount is well below the maximum objective for the Nez Perce National Forest.

2. Environmental Consequences

Alternative 1 (No Action)

Direct and Indirect Effects. Under the no-action alternative, channel morphology would continue to be negatively impacted by the sediment load originated from the landslides. Additionally, the stream channel would continue to be confined by the road. Road sand, gravel, and road fill from the 309 Road, as well as pollutants, would continue to enter the stream. This alternative would not clear additional landslide material, reconstruct the road, or restore the stream channel. No short-term turbidity pulses would be caused by road work, or channel construction/connection, and no sediments related to new construction would affect water quality within Mill Creek.

The indirect effects stem from poor floodplain and riparian conditions caused by the proximity to the road on one side, and the input of landslide debris on the other side. This would indirectly limit the recovery of the South Fork Clearwater River from its 303d sediment impairment conditions as a result of increased sediment load inputs coming from Mill Creek.

Alternative 2 (Proposed Action)

Direct and Indirect Effects. Project construction under this alternative would generate short-term increases in sediment loads and turbidity in Mill Creek. Short-term plumes of fine-grained sediment would be released into Mill Creek when in-stream channel work takes place and when water is diverted into the road ditch. However, turbidity levels are expected to substantially dissipate downstream. Monitoring and project design criteria would ensure that State turbidity standards would be met.

The photograph on the next page is of a similar stream channel (Elk Creek) on the nearby Clearwater National Forest which was inundated by a landslide. This picture shows the channel during construction with raw stream banks that were a direct source of sediment for the stream channel. This is a good example of direct sedimentation into the stream from initial restoration activities.

Elk Creek on the Clearwater National Forest after the 1993 landslide

The new channel and floodplain complex would be designed to allow streamflows to overflow the main channel onto the floodplain during flood events. Creation of floodplain would help to incrementally reduce the size of flood peaks by temporarily storing water on the floodplain. Increasing channel sinuosity and reducing the flow volume in the main channel during flooding would result in slower stream velocities, and hence, lower shear and erosion on the bed and banks of the stream.

Reconstruction of the road channel would create some direct short-term increases in sediment delivery to Mill Creek. However, this re-construction would have net positive impacts because it would help to stabilize the road in the long term.

The revegetation plan would accelerate establishment of riparian vegetation and in the case of the parking area allow riparian vegetation to establish. A portion of the area would be protected from vehicle use through mitigation measures. This would further enhance the sediment retention capacity of the affected area. Encouraging vigorous riparian vegetation growth would also help lower stream water temperatures and help attain beneficial use for Mill Creek.

Implementation of this project would indirectly affect the South Fork of the Clearwater River, a waterbody listed on the 303d list for sediment impairment. During construction, there would be potential for some increased sedimentation into the South Fork Clearwater from diverting the stream channel. However, in the long term, implementation of this project would help to reduce a source of sediment into the South Fork Clearwater River.

Elk Creek landslide restoration on the Clearwater National Forest 10 years after construction

The above photograph shows the Elk Creek landslide restoration on the nearby Clearwater National Forest. This picture is 10 years after restoration activities. Notice that the raw stream banks and sediment sources that were exposed during and directly after construction have re-vegetated and are no longer a sediment source. The thriving riparian zone acts as a filter for sediment, as fine sediments settle out in the floodplain.

Cumulative Effects

For cumulative effects analysis, the Nez Perce National Forest typically uses current conditions from the NEZSED and ECA models and then projects future values for the proposed activities. However, the current proposed activities are too small to be considered a large activity or 'sediment entry' for the NEZSED model and too small to have any changes to ECA calculations.

Regardless, the current values for both NEZSED and ECA are well below both Forest standards and accepted 'yellow flag' thresholds. This, in addition to the fact that the intent of the proposed activity is to improve stream conditions and sedimentation, leads to the conclusion that there would be no negative cumulative effects for the proposed action.

G. Aquatic Resources

1. Affected Environment

Stream Characteristics. Mill Creek supports Snake River spring/summer Chinook salmon, steelhead trout, redband trout, bull trout, and westslope cutthroat trout. Snake River spring/summer Chinook salmon, redband trout, and westslope cutthroat trout are Region 1 Forest Service sensitive species. Steelhead trout and Columbia River bull trout are listed as threatened under the ESA. Snake River fall Chinook are not found within the Mill Creek or South Fork Clearwater River watersheds. Critical habitat for this species occurs over 40 miles downstream from the project area. The project would have no effect on the species or their habitat and will not be discussed further in this document. Pacific lampreys, a Region 1 Forest Service sensitive species, are not present within Mill Creek, but are found within the South Fork of the Clearwater River.

Surveys of fisheries habitat in October 2009 found substrate in the proposed project reach that was unsuitable for steelhead, cutthroat, bull trout, or Chinook spawning. Rearing habitat quality is also low due to sediment levels and a lack of large wood and riparian vegetation. Aquatic habitat is much more suitable with fewer fines, more riparian vegetation, and more instream cover in the reaches above the project area.

The Nez Perce Forest constructed instream structures in the lower reaches of Mill Creek in 1987 designed to improve spawning habitat for steelhead trout and Chinook salmon. The Nez Perce Tribe has also been working with the Forest to improve fish passage and habitat conditions in this drainage.

The Nez Perce Tribe conducted snorkel surveys in Mill Creek in 2007, 2008, and 2009. These surveys found young-of-the-year Chinook salmon, juvenile steelhead trout, bull trout, cutthroat trout, and brook trout at the mouth of Mill Creek. Steelhead and cutthroat trout were found well upstream of the project area.

Appendix E contains an excerpt of the goals, standards and guidelines, and management objectives from amendment 20 to the Nez Perce Forest Plan (USDA Forest Service 1987).

Endangered and Threatened Species Analyzed.

Steelhead Trout: Steelhead trout (*Oncorhynchus mykiss*) in the Snake River steelhead ESU (evolutionarily significant unit; or distinct population segment) are listed as a threatened species under the Endangered Species Act (*Federal Register* Vol. 62, No. 159, August 18, 1997). Steelhead trout spawning and rearing in the Mill Creek area generally enter fresh water in late summer and fall, and spend the winter in the lower and middle Clearwater River below Kooskia. They remain in the large pools of the mainstem Clearwater River throughout the winter months, and then move up into the South Fork during the spring to spawn. Spawning usually occurs in April and May, probably in the mainstem and lower reaches of tributary streams including Mill Creek. Juveniles usually spend about 2 years (sometimes 3 years) in streams and rivers before migrating downstream to the ocean during the spring runoff period in May and June (Behnke 2002).

Steelhead trout require small and large gravel for spawning. Juveniles are found in a variety of habitat types where cover (riparian vegetation, rocks, wood) is available. They are well suited to fast-water habitats and less dependent on pools than other species. Variables influencing steelhead habitat include riparian vegetation, channel morphology, streamflow, deposited sediment, and winter snow and ice accumulations (Marcus et al. 1990).

Status of Steelhead Trout in the Project Area: Juvenile steelhead trout of all sizes have been found during repeated surveys of Mill Creek. Adult steelhead spawn in Mill Creek; however, during a 2010 observation of the project area no evidence was found that steelhead were spawning in the project area. This is likely due to the less than optimal substrate present in the project area (Seloske, G., 2010, *personal communication*).

The South Fork Clearwater subbasin and all accessible tributaries, including Mill Creek, were designated as critical habitat for steelhead (*Federal Register*, Vol. 65, No. 32, February 16, 2000).

Bull Trout: Bull trout (*Salvelinus confluentus*) in the Columbia River basin have been listed as threatened under the Endangered Species Act (*Federal Register*, Vol. 63, No. 111, June 10, 1998). Bull trout are especially vulnerable to human-induced factors that increase water temperature and sediment loads, change flow regimes, block migration routes, and establish nonnative trout, particularly brook trout (Behnke 2002). Declining abundance and increasing levels of fragmentation typify bull trout populations throughout their range, which includes Idaho.

Status of Bull Trout in the Project Area: The mainstem South Fork Clearwater River is not known to be preferred bull trout spawning habitat. The mainstem is used as a migration corridor for the fluvial bull trout. Mill Creek may support fluvial bull trout. During the recent snorkel surveys by the Nez Perce Tribe bull trout were observed in low densities at the mouth of Mill Creek.

Critical habitat for bull trout has been proposed by the USFWS (*Federal Register*, Vol. 67, No. 71235, 2002) and is under review at this time. Mill Creek is part of the proposed critical habitat.

Sensitive Species Analyzed.

Snake River Spring/Summer Chinook Salmon: Spring/summer Chinook salmon (*Oncorhynchus tschawytscha*) are considered a sensitive species in the Northern Region, USDA Forest Service, and are a species of special concern in the State of Idaho.

Spring/summer Chinook spawn in the mainstem South Fork Clearwater River downstream from the project area (Paradis, W., 1990, 1991, *personal observation*). The South Fork Clearwater also serves as a migration corridor and provides winter rearing for juvenile fish (Paradis, W., 1989, *personal observation*).

Status of Spring/Summer Chinook in the Project Area: Juvenile chinook, both age 0 and age 1 classes, were observed in Mill Creek during all 3 years of the recent Nez Perce snorkel surveys.

Pacific Lamprey: Pacific lamprey (*Lampetra tridentata*) is considered a State of Idaho species of special concern. Recent sampling in the South Fork Clearwater River indicated the presence of juvenile lampreys along the mainstem river and some of the tributaries. Currently Pacific lamprey are thought to be absent from Mill Creek, but they are found directly downstream of the project area in the South Fork of the Clearwater River (Nelson 2004).

Lampreys are an eel-like aquatic vertebrate that lack the jaws and paired fins of true fish (Moyle 2002). Adult lampreys usually move into spawning streams between March and late June. These adults may be holding in the rivers over the winter before they spawn. Juvenile lamprey ammocoetes will spend 5 to 7 years in the mud and sand margins of streams. Ammocoetes are filter feeders, subsisting on organic matter and algae.

Status of Pacific Lamprey in the Project Area: Pacific lamprey are not known to be present in Mill Creek. Substrate in the project area is too large for the ammocoetes.

Westslope Cutthroat Trout: Westslope cutthroat trout (*Oncorhynchus clarki lewisi*) are considered sensitive in the Northern Region, U.S. Forest Service, and a species of special concern by the State of Idaho. Cutthroat trout are widely distributed across the Clearwater Basin, although the current abundance is probably less than that historically.

Weaver and Fraley (1991) demonstrated a negative relationship between juvenile westslope cutthroat trout emergence success and the percentage of fine sediments in substrate in an artificial environment. Biologists' ability to predict the effects of fine sediment on wild populations remain questionable (Everest et al. 1987), but excessive amounts of fines have been shown to adversely affect habitat availability (U.S. EPA 1991). Variables most influencing cutthroat trout habitat include riparian vegetation, channel morphology, streamflow, deposited sediment and winter snow and ice accumulation (Marcus et al. 1990).

Status of Westslope Cutthroat Trout in the Project Area: Cutthroat trout were observed during the Mill Creek snorkel surveys conducted by the Nez Perce Tribe. This species had the highest density of all species observed during the 2009 survey.

Redband Trout: Redband trout are classified as the same species as anadromous steelhead, except fish included in this category spend their entire lives in a stream or river, often at or near their natal area.

Redband trout are present in the Clearwater drainage along with steelhead, but because of the difficulty in identifying juveniles of these two life forms, redband trout in these drainages are included under the steelhead distribution (IDFG 2005).

The main threats to redband trout populations are habitat loss, fragmentation of current habitat, isolation of existing populations, and hybridization with coastal rainbow trout and cutthroat trout (IDFG 2005).

Status of Redband Trout in the Project Area: Juvenile steelhead trout of all size classes were identified during repeated surveys of Mill Creek. Juvenile redband trout and juvenile steelhead are difficult to distinguish. It is likely that some of the fish identified as steelhead during these surveys were redband trout since they are known to be found in the Clearwater Drainage.

2. Environmental Consequences

Alternative 1 (No Action)

Direct and Indirect Effects.

Steelhead, Bull Trout, Steelhead Critical Habitat and Bull Trout Proposed Critical Habitat: These two species and their critical habitats are analyzed in the same section because of their similar habitat requirements and presence within Mill Creek.

With this action no ground disturbing activities would take place. The stream channel would remain next to Road 309, and would likely continue to erode the road bed during high flows.

This alternative could indirectly affect steelhead and bull trout because fine sediment would chronically enter the stream and reduce habitat quality. Increased sediment could also decrease prey availability (fish and aquatic macroinvertebrates). Steelhead critical habitat and bull trout proposed critical habitat could also be affected by the continued influx of sediment. Increased sediment could alter critical habitat by: decreasing pool depth, making spawning gravels unavailable, and decreasing prey availability. The duration of these effects is not known, but would likely continue until a corrective action takes place. Salmonids would not be affected by take or harassment with this alternative.

Snake River Spring/Summer Chinook Salmon and Westslope Cutthroat Trout: These two species are analyzed in the same section because of their similar habitat requirements and presence within Mill Creek. The potential effects on these two species are the same as discussed for steelhead and bull trout.

Pacific Lamprey: The continued input of elevated sediment levels into the South Fork of the Clearwater from the no-action alternative could alter lamprey habitat and decrease prey availability. This would indirectly affect individual lampreys. These effects would continue for an unknown period of time, likely continuing until a corrective action is implemented.

Alternative 2 (Proposed Action)

Direct and Indirect Effects.

Steelhead Trout, Bull Trout, Steelhead Critical Habitat and Bull Trout Proposed Critical Habitat: These two species and their critical habitats are analyzed in the same section because of their similar habitat requirements and presence within Mill Creek. These two species do have different water temperature requirements; bull trout require much colder water than steelhead for spawning and rearing. However, given the small size of this project the effects to temperature are likely to be small. Therefore these species are analyzed together.

Direct effects to listed fish could occur prior to and during the dewatering process. Prior to dewatering, Mill Creek just upstream of the streamflow diversion site would be block netted. This should prevent any fish upstream of the in-channel construction from entering into the flow diversion and planned dewatered channel. The dewatered stream channel would be monitored for potential entrained fish. Electrofishing would be conducted to remove any entrained fish. These fish would be relocated well upstream (> 1 mile) of the in-channel activities. Electrofishing itself may cause mortality to a few individual juvenile steelhead or bull trout, causing direct effects to ESA-listed fish.

There is also potential that individual trout may be stepped on during the removal process. This removal process effect should be brief (less than 2 days) and would only affect the stream channel where instream activity would take place. The likelihood of stepping on fish is considered low. The channel would be dewatered in the following manner: half of the water would be removed in the first 24 hours, the remaining half in the second 24 hours. This would allow aquatic organisms to detect the change in water levels and move out of the construction area. The risk of fish mortality is higher during the winter construction period as fish are less mobile and may not be as easy to remove. They would not be as visible due to snow and ice cover on the stream or they may be seeking cover in the substrate.

Connection to upstream/downstream habitat will be blocked for up to 3 weeks, the time that the instream portion of the project will likely take to complete. This would prohibit fish movement for that time frame which may increase competition and decrease prey availability. This effect will be temporary and would not cause long-term indirect effects.

Project construction under this alternative would generate short-term increases in sediment loads and turbidity in Mill Creek. Short-term plumes of fine-grained sediment would be released into Mill Creek when water is diverted into the road ditch and again when the channel is rewatered. Monitoring would take place downstream to ensure that if turbidity standards are exceeded, operations would be suspended until they reach acceptable levels (Arias and Walters 2010). Prior to diverted stream flows re-entering the Mill Creek stream channel, a sediment settling basin would be incorporated as part of the design and monitored for effectiveness through flow diversion activities to reduce likely impacts.

Indirect effects to listed fish or their habitat during either the summer or winter construction period could occur from the sediment released/moved during the channel realignment and associated activities. Fine

sediment could fill the interstitial spaces in the gravel at and downstream from the site reducing juvenile overwintering habitat. Pool depth could be reduced and pocket pools and other lower flow habitat within riffles could become unavailable. These effects are expected to be minimal due to design features included in the project (seasonal timing, dewatering/rewatering over 48 hours, lined diversion ditch, settling pond). Steelhead and bull trout habitat components will be most affected within the project area in the short term due to the proximity of the activity. The risk of effects would be low due to the limited habitat available at the site. Effects downstream in Mill Creek should be minimal due to the implementation of design features. Critical habitat in the South Fork of the Clearwater should not be measurably affected due to the 1.5 mile distance from the construction activities to the river.

Winter construction would require almost 5 miles of snowplowing to the waste area site on Forest Road 9408. Plowing would not have any effects to fish or their habitat. Trucks hauling material up to the site have a slightly higher risk of sliding off the road due to icy conditions than those hauling during the summer construction period. The potential exists for a fuel spill during either construction season where about 1.5 miles of the road runs adjacent to Mill Creek. Based on past restoration activities, the risk of a spill is considered low for either time period.

Stream restoration activities should decrease sediment in the long term. This project should positively affect steelhead and bull trout critical habitats, enhancing constituent elements such as sufficient substrate and prey availability. Also, the restoration project should improve juvenile and adult steelhead and bull trout habitat components such as substrate, cover, and resting opportunities within the project area. The proposed action includes revegetation along the streambanks which will eventually provide shading and cover, instream rocks that will provide areas of slower flow and cover, streambanks will be stabilized reducing the amount of fine sediment, and large woody debris will be added providing cover and habitat complexity.

Implementation of this project will indirectly affect the South Fork of the Clearwater River, a water body listed on the 303(d) list for sediment impairment. During construction, there is the potential for some increased sedimentation into the South Fork Clearwater. It is likely to be very low due to the 1.5 mile distance between the project site and the South Fork.

Sediment from instream projects is usually visible for a maximum of 0.5 miles downstream directly following the rewatering of the site. The effects last less than a day. Forest culvert removal and channel reconstruction monitoring in 2000 indicates that the turbidity exceeded State standards by twenty fold when coffer dams were removed and water allowed to flow back into the reconstructed stream channel (USDA Forest Service 2000). Turbidity levels returned to baseline levels 300 feet below the site within 12 hours of coffer dam removal. The turbidity is primarily caused by disturbing existing instream sediments during coffer dam removal and channel re-contouring activities.

Additional monitoring by Foltz et al. (2008) on culvert removals on the Horse Creek drainage on the NPNF found no detectible sediment 2,657 feet (about 0.5 mile) downstream of the instream activities. These results were found without any type of mitigation measures. Slowly watering and dewatering the site with associated turbidity monitoring will likely cause less sediment than in the published study (Foltz et al. 2008).

The proposed management activities in the project area have the potential to affect the listed species through mortality associated with an accidental fuel spill. This potential effect should only last as long as the actual project activities when machinery will be on site. The probability of an accidental spill which could involve the incidental take of one of the listed species is assumed to be very low based on past restoration activities near streams. However, the risk of a catastrophic accident that would affect the listed species, including one which causes direct mortality, cannot be eliminated. Risks are primarily

associated with transport, storage, and transfer of fuel. The lining or piping of water in the diversion ditch line should reduce the potential for additional toxic inputs into the stream channel.

Essential Fish Habitat: Essential fish habitat (EFH) is designated for Chinook salmon in the South Fork Clearwater River. EFH for Chinook includes areas historically accessible, which would include Mill Creek. Direct effects of the proposed action are expected to have short-term negative effects on Snake River spring/summer Chinook salmon EFH in this drainage as discussed previously. This project would have no measurable short- or long-term effects to EFH in the mainstem Clearwater River.

Table 3-2 lists affects ESA determinations by species. For full details of the affects determinations, see the fisheries biological analysis in the project file.

Table 3-2. Determination of effect by species, critical habitat, and essential fish habitat

Species	No Effect	Not Likely to Adversely Affect	Likely to Adversely Affect	Critical Habitat Likely to Adversely Affect
Snake River Fall Chinook	X			
Steelhead/Redband Trout			X	X
Bull Trout			X	X
Essential Fish Habitat (Chinook)	X (South Fork of the Clearwater River)	X (Mill Creek)		

Snake River Spring/Summer Chinook Salmon and Westslope Cutthroat Trout: The effects of the project on these species would be the same as for steelhead and bull trout.

Pacific Lamprey: Implementation of this project would not likely affect the South Fork of the Clearwater River due to the 1.5 mile distance from the project site. Project design features would minimize sediment input into the South Fork. Additional sediment could indirectly affect Pacific lamprey by altering habitat and decreasing prey availability, but the likelihood is very low. In the long term, implementation of this project would help to reduce a source of sediment into the South Fork of the Clearwater River.

Table 3-3 contains the final determination of effects for sensitive species. See the fisheries biological evaluation for full details of the effects determination.

Table 3-3. Determination of effect for forest sensitive species

Species	No Impact	May Affect Individuals but Not Likely to Cause a Trend to Federal Listing or Loss of Viability
Snake River Spring/Summer Chinook		X
Westslope Cutthroat Trout		X
Pacific Lamprey		X

Cumulative Effects

The model NEZSED, which is used to predict sedimentation and cumulative effects (see previous "Watershed" section), showed an 8 percent increase over natural background conditions. This model does not take into account affects from livestock grazing. There are several tracts of private land in the Mill Creek Watershed. Approximately 0.5 miles of Markham Creek, a tributary of Mill Creek, flows through the Lamb Ranch (T29N R4E, Sec 4). The Markham Creek drainage has a USFS allotment permitting

livestock grazing. These cattle go onto the Lamb Ranch private property and are negatively affecting Markham Creek and likely contributing negatively to Mill Creek (Seloske, G., 2010, *personal communication*).

It is unknown what other types of watershed influences are taking place on private land within Mill Creek Watershed. However, given the distance from the riparian zone of most of these private lands, it is unlikely they are increasing much beyond the 8 percent above background levels as calculated by the NEZSED model. In any case, the Forest standards are 35 percent above background levels and are likely not being approached. Therefore, it is unlikely there would be a significant contribution to the effects to ESA-listed fish for this analysis.

Multiple timber harvests have occurred on Forest Service land within the Mill Creek Watershed. BMPs were likely followed for these sales preventing significant amounts of sediment from entering Mill Creek. Road 309 runs along Mill Creek for approximately 3 miles, then turns upslope and runs above Mill Creek and crosses several of its tributaries. This road is not paved and is likely adding sediment to the creek. The sediment from these projects is accounted for in the NEZSED model. Therefore, these projects would not add any more sediment than the current 8 percent over background.

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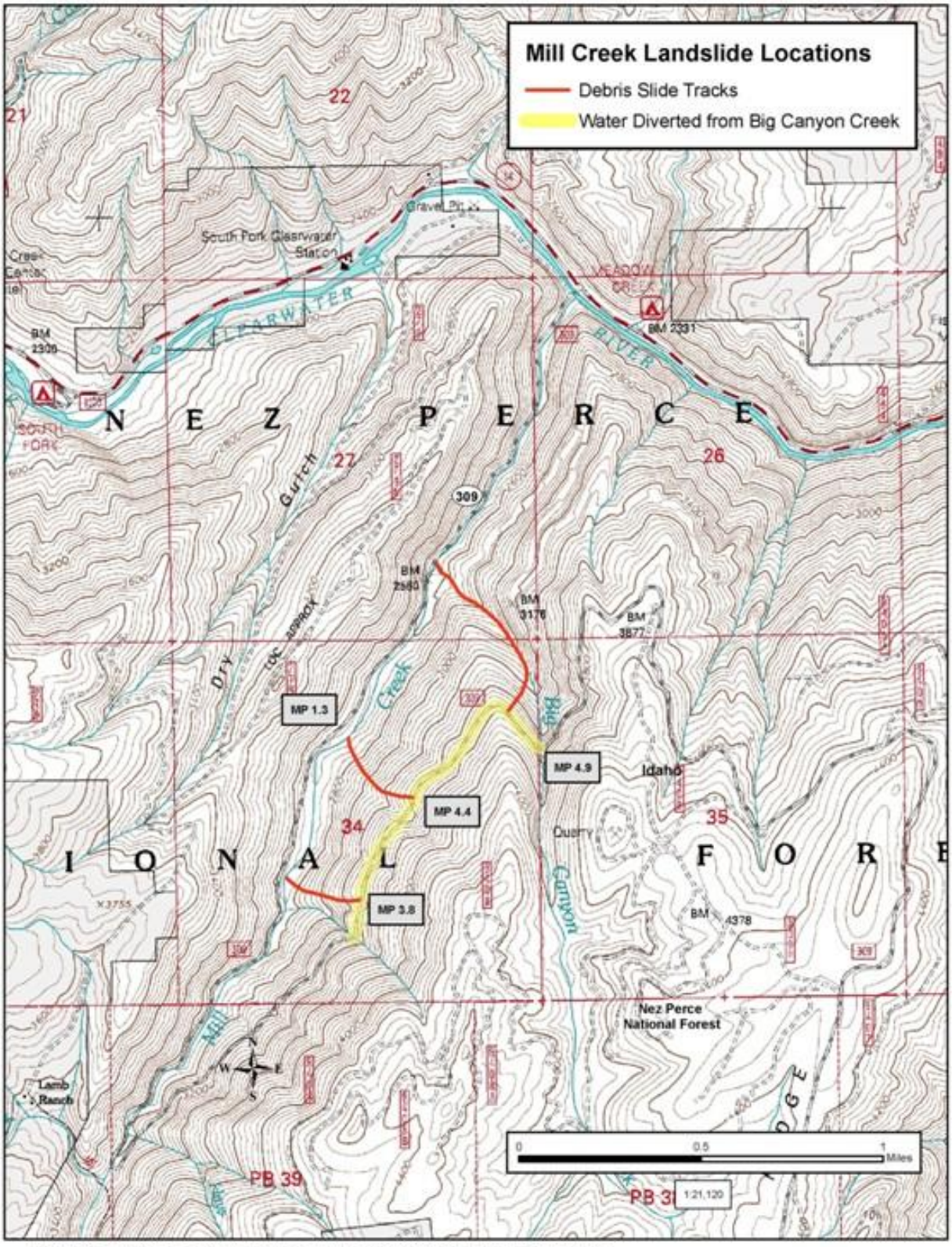
Appendix A: Map of Mill Creek Project Area with Landslide Locations



Appendix B: Project Design and Mitigation Measures

Item	Project Design Measure
Botany	
B-1	Remove all mud, soil, and plant parts from all off-road equipment before moving into project area to limit the spread of weeds. Cleaning must occur off National Forest lands. This does not apply to service vehicles that would stay on the roadway, traveling frequently in and out of the project area.
B-2	Apply Forest Service-approved native plant species or nonnative annual species to meet erosion control needs and other management objectives such as riparian restoration and wildlife habitat enhancement. Regional plant and seed transfer guidelines would be observed. Undesirable or invasive plants would not be used. Apply only certified weed-free seed and straw for these projects to reduce the introduction of weed species.
B-3	All rock used for surfacing would be county-certified as free of noxious weed seed.
Transportation	
T-1	Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on government land.
T-2	Before beginning any work, submit a hazardous spill plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following: ▪ Description of the item spilled (including identity, quantity, manifest number, and other identifying information). ▪ Whether amount spilled is EPA or State reportable, and if so whether it was reported, and to whom. ▪ Exact time and location of spill including a description of the area involved. ▪ Containment procedures. ▪ Summary of any communications contractor had with news media, Federal, State and local regulatory agencies and officials, or Forest Service officials. ▪ Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue. When available provide copies of all spill-related clean up and closure documentation and correspondence from regulatory agencies. The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in comliance with Federal, State, and local laws and regulations.
T-3	Fourteen days prior to the start of construction, submit a written plan for review that provides permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction. Include methods to minimize disturbance to the stream and prevent runoff from the construction site entering directly into the stream. The soil erosion control plan must address construction activities that have the potential for stream sedimentation. The contractor shall address fill slope protection including erosion and sedimentation as part of the soil erosion control plan.
T-4	Prior to the start of construction, submit a written stream diversion plan that outlines the methods and location to divert the stream around the work area. Contractor will give the CO 14 days prior notice before dewatering for fish rescue efforts per contract section H. Rewatering of stream channel will be subject to State turbidity regulations. The CO should coordinate the stream dewaterign plan with aquatics specialists.
T-5	The application of seed to cut & fill slopes shall be within 14 days after the road has been constructed to final grade, unless otherwise agreed by the CO. Cut & fill slopes damaged by construction activities such as surface blading or additional excavation shall be reseeded within 10 days of the damage, unless otherwise agreed to by the CO.

T-6

Apply seed by the dry method. The kind of seed to be furnished and the amounts to be applied in terms of pure live seed (PLS) shall be as follows:

Grass Species	PLS Factor (90% Pure, 90% Germ)	Seeds/lb	PLS/sq. ft.	Bulk lbs/acre (rounded to next lb)
Annual Rye (*Lolium multiflorum*)	0.81	227,000	40	10
Garnet Mountain Brome (*Bromus marginatus*)	0.81	90,000	20	12
Blue Wildrye (*Elymus glaucus*)	0.81	110,000	20	10
Nezpurs Idaho Fescue (*Festuca idahoensis*)	0.81	450,000	20	2.5

Note: Apply this mix at 34.5 lb/acre.

T-7

Storage of more than 200 gallons of petroleum products on the project must be under the rules and regulations of the State of Idaho Forest Practices Act (IDAPA 20.02.01) and Pacfish Standard RA-4. A partial list of these requirements are listed below.

a) Storage containers shall be sited within a constructed dike of sufficient size to contain 125% of the volume of the petroleum products stored in the tanks. Containment areas shall be lined with an impermeable membrane.
b) The storage areas shall be located more than 300 feet from any existing stream courses.

T-8

Fueling of equipment shall be done in a manner to eliminate potential spills. Transfer trucks shall be limited to 200 gallons maximum. Fueling of equipment shall take place a minimum of 300 feet from any stream course. If this requirement cannot be met a written spill plan must be approved by the COR. All spills shall be reported immediately to the COR. Spills over 25 gallons must be reported to the Idaho Division of Environmental Quality.

T-9

Work also includes cleaning of all equipment used at the project site. Clean all construction equipment prior to entry on the project site. Remove all dirt, plant parts, and material that may carry noxious weed seeds into the area. Only construction equipment inspected by the Forest Service will be allowed to operate within the project area. Inspection will occur before moving onto the Forest. The contractor must provide a minimum of 24 hours notification prior to inspection. Treat subsequent move-ins of equipment the same as the initial move-in. Clean truck beds and dump boxes hauling to the project site prior to entering the work area. "Construction equipment" does not include pickup trucks and personal vehicles.

T-10

Prior to the initial move-in, and all subsequent move-ins, the contractor shall make all construction equipment available for inspection by the Forest Service at an agreed upon location. The contractor shall give the Forest Service at least 24 hours advance notification when equipment is ready for inspection.

T-11

Each commercial aggregate or material source shall be certified as weed free. The source shall be inspected and certified by the county extension agent from the source county. The contractor shall furnish the Forest Service with a statement of certification.

T-12

Straw/hay bales shall be certified as weed free. The source field shall be inspected and certified by the county extension agent from the county that the straw/hay is grown. Each shipment onto the Forest shall be accompanied by a certification tag stating that it is weed free. The contractor shall furnish the Forest Service with a statement of certification.

T-13

Provide bales, wattles, logs and rolls from a certified noxious weed free source.

T-14

Conditions on Use of Premises (Camping)

- Camping will be allowed only at the sites designated on the project maps or approved in advance by the district ranger.
- No improvements of a permanent nature shall be constructed without prior written approval of the COR.
- Temporary structures such as tent frames, hitch racks, tents, and tent pegs; shall be removed at the end of the period of use; all evidence of the camp eliminated; and the site restored to its original condition. Final payment will not be authorized until the campsite has been cleaned up and the site is approved by the contracting officer or his designated representative. Reusable native material may be neatly stacked for future use.

	▪ Vegetation shall be undisturbed to the maximum extent possible. The contractor will be permitted to cut only those trees designated by the COR. ▪ Storage of petroleum products in excess of 50 gallons at the campsite will require the approval of the COR. All petroleum spills shall be immediately cleaned up. All spills will be reported immediately to the CO or COR. Spills over 25 gallons will be reported to the Idaho State Department of Environmental Quality. No waste disposal of petroleum product will be permitted on National Forest land. ▪ Chemical toilets are preferred for all campsites; however, the contractor may be permitted to construct a slit trench when conditions warrant. Any slit trench constructed shall not be located closer than 400 feet to any live stream and is subject to approval of the COR. The trench shall be covered and the area restored to as natural a condition as possible when the camp is closed. ▪ Refuse including waste materials, garbage, and rubbish of all kinds, shall be disposed of in the following manner, and shall guard the purity of streams and living waters: ▪ Garbage, trash, sewage waste, and other litter shall be kept in closed fly-proof containers and periodically hauled to an approved disposal facility located outside of the National Forest. ▪ Waste water shall be disposed of in a leach pit located at least 300 feet from springs, streams, and lakes. The pit shall be a minimum of 2 x 2 x 2 feet and shall be filled with rock 2 to 8 inches in diameter. The leach pit shall be covered with at least 2 feet of compacted soil when the camp is closed. ▪ No waste or by-products shall be discharged if they contain any substances in concentrations which will result in substantial harm to fish and wildlife, or to human water supplies. ▪ Storage facilities for materials capable of causing water pollution, if accidentally discharged, shall be located so as to prevent any spillage into waters, or channels leading into water, that would result in substantial harm to fish and wildlife or to human water supplies. ▪ The camp area shall be maintained to present a clean, neat, and orderly appearance. Disposal of trash and debris, unusable machinery, Forest Service authorized improvements, etc., shall be kept current. Building materials, firewood, etc., shall be neatly stacked. ▪ The campsite shall be left in a clean condition. Any clean-up work not accomplished by the contractor at time of camp closure will be done by the Forest Service, and the actual cost of such clean-up will be deducted from payment otherwise due the contractor.
Watershed Resources	
WR-1	Suspend construction operations during wet weather conditions (rainstorms or snowmelt) that raise stream levels and threaten to overflow the stream diversion, create excessive resource damage, or otherwise exceed state turbidity standards.
WR-2	Suspend construction operations if state turbidity standards are exceeded. This would be a one-time increase of 50 NTUs above background levels or 10 days of increase of 25 NTUs above background levels. Operations can be resumed when State standards are met again.
WR-3	Restrict activities when soils are wet to prevent resource damage (indicators include excessive rutting, soil displacement, and erosion).
WR-4	Heavy equipment used for this project would be inspected for hydraulic leaks each day prior to entering the stream channel, and any accumulated oil or grease would be removed prior to use of the equipment.
WR-5	Secure all required permits prior to implementation (e.g., stream alteration, 404, etc.).
WR-6	During instream habitat improvement activities, tree felling in RHCAs (riparian habitat conservation areas) would occur only where that activity would not affect riparian management objectives for shade and wood debris recruitment.
WR-7	Stream gradient will entail a gradient of less than 3% for the upper 310 feet of stream and the lower 210 feet of stream.
Fisheries	
F-1	Design will incorporate a roughened channel/constructed riffle design.
F-2	A wood structure will be placed at the toe of the landslide fan to help catch landslide material.
F-3	The three large conifers on site will be incorporated into the stream channel/bank. This will help stabilize the stream, keep it from undermining the slide, and create beneficial habitat.
F-4	Rip-rap on west stream bank will remain intact to protect the road from flooding.
F-5	The channel will be dewatered in the following manner: one-half of the water will be removed in the first 24 hours, the remaining one-half in the second 24 hours.
F-6	The channel will be rewatered in the following manner: one-half of the water will be returned to the

	reconstructed stream channel in the first 24 hours, the remaining one-half in the second 24 hours.
F-7	Prior to channel dewatering and stream flow diversion, the stream flow diversion route will either be lined or an adequately sized pipe will be put in place to carry the diverted stream flow.
F-8	A sediment settling basin will be constructed within the diverted stream flow path, as near to the end of the diversion route as feasible. This will allow sediment to settle out before the flow is returned to the Mill Creek stream channel. This will be monitored while flow diversion is underway to ensure adequacy and effectiveness.
F-9	Snow will not be completely removed. In general, a minimum 2 inches of snow must be left on the roadway during plowing operations to protect the surface of the road.
F-10	Ditches and culverts will be made functional during snow plowing operations.
F-11	Sidecast material will not include dirt and gravel.
F-12	Snow berms will not be left on the road or shoulder unless drainage holes are opened and maintained. Drainage holes will be spaced as required to obtain satisfactory surface drainage without discharge on erodible fills.
F-13	Damage from, or as a result of snow removal, will be restored in a timely manner.
Wildlife	
WL-1	Notify the unit biologist should any threatened, endangered, or sensitive species be sighted in the project area during implementation. The wildlife biologist will determine appropriate measures necessary to avoid adverse effects.
WL-2	Retain trees with obvious cavities or large stick nests.
Watershed Resources	
WR-1	Retain areas of intact functioning riparian vegetation where possible during stream restoration work.
WR-2	Protect riparian areas by defining any motorized travel for dispersed camping.
Public Safety	
PS-1	Require operator to set up warning signs advising of equipment operations or hazards for public safety.
Cultural Resources	
CR-1	Halt ground-disturbing activities if cultural resources are discovered until an archaeologist can properly evaluate and document the resources in compliance with 36 CFR 800.

Appendix C: Nez Perce Forest Plan (1987) Guidance, Laws, and Regulations Relating to Water Quality and Sediment

C II. Forest-wide Management Direction

Forest Plan direction is abbreviated here to include only those criteria that apply to this project.

A. Forest Plan Goals (USDA Forest Service 1987, page II-1):

20) Maintain or enhance stream channel stability and favorable conditions for water flow.

21) Provide water of sufficient quality to meet or exceed Idaho State Water Quality Standards and local and downstream beneficial uses.

22) Protect or enhance riparian-dependent resources.

B. Forest Plan Objectives (USDA Forest Service 1987, page II-5):

Water

The current Idaho Water Quality Standards will be met or exceeded. This will be accomplished through fishery/water quality drainage objectives and resulting sediment budgets; careful riparian area management; application of best management practices; and soil, water, and fishery resource improvement projects. These management objectives and activities will minimize soil erosion and any resulting stream sedimentation. Effectiveness of these drainage objectives, conservation practices, and improvement projects will be evaluated by water quality monitoring and fishery habitat surveys.

Stream channel stability and integrity will be maintained by limiting increases in water yields. Channel stability will be evaluated by stream inventories[.]

Facilities

All transportation systems will be constructed to standards which incorporate best management practices (BMPs) and restrict sediment production to a level that meets or exceeds State water quality standards. Roads, generally, will be designed so that a minimum of 60 percent of the potential sediment predicted to result from the road construction is mitigated. Higher levels of sediment mitigation will be achieved where cost-effective and necessary to achieve multiple-use objectives.

E. Forest Plan Standards:

Water (USDA Forest Service 1987, page II-21)

1. Apply State water quality standards and "Best Management Practices" to land-disturbing activities to ensure State water quality standards are met or exceeded…

2. Use the "Guide for Predicting Sediment Yields from Forested Watersheds" and "Forest Hydrology, Part II–Hydrologic Effects of Vegetation Manipulation" to compare alternative effects on sediment and water yields.

3. Evaluate site-specific water quality effects as part of project planning. Design control measures to ensure that projects will meet Forest water quality goals; projects that will not meet State water quality standards shall be redesigned, rescheduled, or dropped.

8. Meet established fishery/water quality objectives for all prescription watersheds as shown in Appendix A.

Riparian (USDA Forest Service 1987, page II-22, as amended)

1. Allow no management practices in riparian areas that will cause detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment that seriously and adversely affect water conditions and fish habitat. (See 36 CFR 219.27a.)

2. Give preferential consideration to riparian-area-dependent resources in cases of unresolvable conflict (resources such as fish, certain wildlife, certain water-dependent vegetation, and water are totally dependent upon riparian areas). (See FSM 2526.03-2.)

Actions within or affecting riparian areas will include protection and, where applicable, improvement of riparian-dependent resources.

3. Effects on wetlands and flood plains must be considered for all alternatives during the environmental analysis process. (See Executive Orders 11988 and 11990.)

4. Delineate and evaluate riparian areas in project areas prior to implementing any project activity (FSM 2526.03--3).

5. Manage riparian areas to maintain cover and security for riparian-dependent species with emphasis on habitats for threatened and endangered species. Use "Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho" to evaluate the need for and to provide adequate hiding cover and security areas for big game. Biological evaluations, during site-specific project analysis, shall identify needs and recommendations.

C III. Management Area Direction

The Forest Plan identifies management areas (MAs) that describe primary management emphasis, goals and direction. MAs pertinent to the watershed resource include:

Management Area 10 (USDA Forest Service 1987, page III-30):

Management Area 10 consists of lakes, lakeside lands, perennial streams, seasonally flowing streams supporting riparian vegetation, and adjoining lands that are dominated by riparian vegetation.

This area includes the floodplains of streams and the wetlands associated with springs, lakes, and ponds. The natural and beneficial values of riparian areas include groundwater recharge, moderation of flood peaks, maintenance of water quality[.]

Facilities: Roads and Trails

1. Design mitigation measures to reduce sediment from roads constructed in riparian areas by at least 70 percent.

2. Minimize crossings in riparian areas. Cross streams at as near a right angle as practical. Construction parallel to streams (in riparian areas) should be avoided. Opportunities to remove roads and trails from riparian areas should be considered if they are producing significant impacts on riparian-dependent resources.

Management Area 16 (USDA Forest Service 1987, page III-46):

Management Area 16 consists of those lands … that provide winter habitat for deer and elk.

Wildlife and Fish: Access Management

1. Restrict all roads except specifically identified arterials and collectors during winter to reduce disturbance, harassment, and poaching of animals. Roads to be closed shall be identified in the Forest Travel Plan.

Facilities: Roads

1. Construction and reconstruction is permissible when roads are necessary to meet the multiple use objectives on adjacent lands.

The project is located in the Big Canyon Creek Prescription Watershed (17060305-0118). The complete watershed includes three additional prescription watersheds (see table C-1).

Table C-1 (Partial–from appendix A of January 1991 Forest Plan amendment) Forest fishery/water quality objectives by prescription watershed

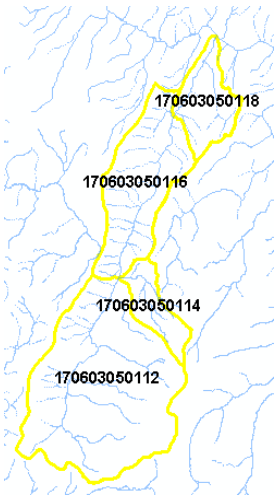
Prescription Watershed Number	Prescription Watershed Name	Beneficial Use	Current Fishery Habitat Potential (%)	Fishery Water Quality Objective (% Habitat Potential) *	Sediment Yield Guideline – Approximate Maximum Sediment Yield to Meet Fish Water Quality Objectives (% over baseline) **	Entry Frequency Guideline–Number of Years in Decade 1 that Sediment Yield Guideline Can be Approached or Equaled
17060305-0112	Upper Mill Creek	A	90	80	45	2
0114	Merton Creek	--	--	70	60	3
0116	Lower Mill Creek	A	100	80	35 ***	2
0118	Big Canyon Creek	A	90	80	35 ***	2

A = Anadromous, R = Resident, MW = Municipal Watershed, -- = No Fishery

* All objectives are relative to full biological potential of 100 percent. Due to varied productivity of each stream, the actual fish production per unit of habitat will vary.

** The sediment yield guidelines were developed using the 1981 version of the Nez Perce Sediment Model and the 1983 version of the Fish Response Model. Technical refinements and model calibration may result in future changes to this column. The values displayed will be used as guidelines during project level analysis. Sediment model results will be used in conjunction with other factors and professional judgment to determine how fish/water quality objectives can be met.

*** These prescription watersheds, unlike most, are not true watersheds. By definition, a true watershed includes all the lands draining through a stream reach. These footnoted watersheds drain only part of such a hydrologic unit and generally contain the downstream reaches of relatively large streams. For sediment yield analyses on these downstream reaches, all upstream prescription watersheds are combined into a true watershed. Sediment yield guidelines (Column 6) apply only to true watersheds. Entry frequency guidelines (column 7) apply to prescription watersheds regardless of whether they are true watersheds.



Forest Plan Amendments

Forest Plan Amendment 20 (March 1995)

Amendment 20, reflecting interagency agreements commonly referred to as PACFISH, directs the identification of riparian habitat conservation areas (RHCAs) and goals, standards and guidelines for their protection.. Included in RHCAs is the identification of landslides and landslide-prone areas.

The Lower Mill Creek Stream Restoration Project area is in a 'Category 1; Fish-bearing stream' RHCA.

Interim Riparian Goals

2. Maintain or restore stream channel integrity, channel processes, and the sediment regime (including the elements of timing, volume, and character of sediment input and transport) under which the riparian and aquatic ecosystems developed.

5. Maintain or restore diversity and productivity of native and desired nonnative plant communities in riparian zones.

Interim Standards and Guidelines

Roads Management:

RF-1: Cooperate with Federal, Tribal, State, and county agencies, and cost-share partners to achieve consistency in road design, operation, and maintenance necessary to attain Riparian Management Objectives.

RF-2: For each existing or planned road, meet the Riparian Management Objectives and avoid adverse effects on listed anadromous fish by:

a. …

b. minimizing road and landing locations in Riparian Habitat Conservation Areas.

c. initiating development and implementation of a Road Management Plan or a Transportation Management Plan….

d. avoiding sediment delivery to streams from the road surface.

1. outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe.

2. …

e. avoiding disruption of natural hydrologic flow paths

RF-3: Determine the influence of each road on the Riparian Management Objectives. Meet Riparian Management Objectives and avoid adverse effects on listed anadromous fish by:

a. reconstructing road and drainage features that do not meet design criteria or operation and maintenance standards, or that have been shown to be less effective than designed for controlling sediment delivery, or that retard attainment of Riparian Management Objectives, or do not protect designated critical habitat for listed anadromous fish from increased sedimentation.

b. prioritizing reconstruction based on the current and potential damage to listed anadromous fish and their designated critical habitat, the ecological value of the riparian resources affected, and the feasibility of options such as helicopter logging and road relocation out of Riparian Habitat Conservation Areas.

RF-4: Construct new, and improve existing, culverts, bridges, and other stream crossings to accommodate a 100-year flood, including associated bedload and debris, where those improvements would/do pose a substantial risk to riparian conditions. Substantial risk improvements include those that do not meet design and maintenance criteria, or that retard attainment of Riparian Management Objectives, or that do not protect designated critical habitat from increased sedimentation. Base priority for upgrading on risks to listed anadromous fish and their designated critical habitat and the ecological value of the riparian resources affected. Construct and maintain crossings to prevent diversion of streamflow out of the channel and down the road in the event of failure.

RF-5: Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.

General Riparian Area Management:

RA-1: Identify and cooperate with Federal, Tribal, State and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

RA-4: Prohibit storage of fuels and other toxicants within Riparian Habitat Conservation Areas. Prohibit refueling within Riparian Habitat Conservation Areas unless there are no other alternatives. Refueling sites within a Riparian Habitat Conservation Area must be approved by the Forest Service and have an approved spill containment plan.

RA-5: Locate water drafting sites to avoid adverse effects to listed anadromous fish and instream flows, and in a manner that does not retard or prevent attainment of Riparian Management Objectives.

Clean Water Act and State Water Quality Standards:

The Clean Water Act stipulates that states are to adopt water quality standards. Included in these standards are provisions for identifying beneficial uses, establishing the status of beneficial uses, setting water quality criteria, and establishing BMPs to control non-point sources of pollution. Section 303(d) of the Clean Water Act establishes requirements for states to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). For waters identified on this list, States must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

Mill Creek is listed in the Idaho Department of Environmental Quality's (IDEQ) current 303(d)/305(b) Integrated Report (DEQ, 2008) under Section 4a: "Waterbodies with approved TMDLs." The South Fork Clearwater River Subbasin Assessment and TMDLs (IDEQ et al. 2004) address water quality-limited streams listed under Section 303(d) of the Clean Water Act. Preparation of the assessment and TMDL was a joint effort of the Idaho Department of Environmental Quality, the Environmental Protection Agency, and the Nez Perce Tribe. The Nez Perce National Forest participated in the assessment and TMDL development, with technical input and representation on the Watershed Advisory Group.

TMDLs were developed for the South Fork Clearwater River for water temperature and sediment. The water temperature TMDL calls for canopy density or shade targets on a stream reach basis throughout the subbasin, including Mill Creek. Different analytical approaches were used to calculate canopy density for forested and non-forested reaches.

For sediment, the TMDL targets a 25 percent reduction in human-caused sediment to the South Fork Clearwater River. No specific targets were set for tributaries, but it was recognized that much of the sediment yield reduction would need to occur in the tributaries.

Within the Nez Perce National Forest in the South Fork Clearwater River Subbasin, 13 water bodies were listed on the IDEQ 1998 303(d) list. Mill Creek was not listed as impaired. The main stem of the South Fork Clearwater River was listed for sediment and water temperature from its mouth upstream to the confluence of Red and American Rivers.

The Idaho State Water Quality Standards do not specifically designate beneficial uses in Mill Creek. As a 'Nondesignated Surface Water', standards for cold water aquatic life and primary or secondary contact recreation apply. Uses in the South Fork Clearwater River are for cold-water communities, salmonid spawning, primary contact recreation, domestic water supply, and special resource waters (IDAPA 58.01.02). General and numeric water quality criteria apply to these waters, depending on their designated and existing beneficial uses. In Mill Creek, water quality criteria that may be affected by this project include water temperature and turbidity.

- *Sediment:* Sediment must not contain quantities that impair beneficial uses. Determination of impairment shall be based on water quality monitoring and surveillance.
- *Water Temperature:* Waters designated for cold-water biota are not to exceed 22°C, with the maximum daily average no greater than 19°C. Waters designated for salmonid spawning are not to exceed 13°C, with the maximum daily average no greater than 9°C.
- *Turbidity:* Turbidity is not to exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days.
- Section 404 of the Clean Water Act requires permits to dredge or fill within waters of the United States. The U.S. Army Corps of Engineers administers these provisions. Most of the instream activities proposed under the Mill Creek Stream Restoration Project will require authorization under section 404, through application of either nationwide or site-specific permits.

Appendix D: Watershed and Fisheries Monitoring Recommendations

Watershed

1. A hydrologist or other qualified aquatic specialist would be present during in-channel work to ensure that mitigation is implemented and any site-specific adjustments during the project are within the effects addressed below.

2. All relevant observations made during this time would be recorded, a photo record of the project would be made, and implementation would be reported in the subsequent subbasin update for the South Fork Clearwater Subbasin.

3. Annual monitoring of the project would occur to ensure all changes are functioning as anticipated. This monitoring would also be reported in the annual South Fork Clearwater Subbasin update. Monitoring would occur until a new channel restoration plan is implemented.

4. Turbidity monitoring would be conducted at critical periods during implementation. The results of this monitoring would be made available to regulatory agencies upon request after the analysis is complete and included in the South Fork Clearwater Subbasin update for that year.

Turbidity cannot reach 25 NTUs above background levels for a 10-day period or 50 NTUs above background levels at any time. Samples would be taken above the work sites to determine background levels. Samples would be collected in the mixing zone below the in-channel work site for turbidity increases. Turbidity would be monitored at least 20 to 30 percent of the time machinery is working on in-channel habitat improvements. Samples would be collected using a DH-48 depth integrated sampler. The DH-48 depth integrated sampler integrates width and depth of the mixing zone and the entire channel width in the fully mixed zone. Samples would be analyzed using a Hach field turbidimeter.

In the event of exceeding turbidity standards, operations would be suspended until a time when standards are met.

Fisheries

The purpose of the monitoring is to determine if specific management direction was correctly interpreted and followed. Implementation monitoring would provide feedback on whether internal mechanisms tracking project design and mitigation measures are adequate. Periodic implementation monitoring would determine whether design measures established in the Mill Creek EA are being carried out.

Appendix E. Guidance from Forest Plan Amendment 20 (1987) for Compliance with PACFISH

Interim Riparian Goals

1. Maintain or restore water quality to a degree that provides for stable and productive riparian and aquatic ecosystems.

2. Maintain or restore stream channel integrity, channel processes, and the sediment regime (including the elements of timing, volume, and character of sediment input and transport) under which the riparian and aquatic ecosystems developed.

3. Maintain or restore instream flows to support healthy riparian and aquatic habitats, the stability and effective function of stream channels, and the ability to route flood discharges.

6. Maintain or restore riparian vegetation to:

a) provide an amount and distribution of large woody debris characteristic of natural aquatic and riparian ecosystems;

b) provide adequate summer and winter thermal regulation within the riparian and aquatic zones; and

c) help achieve rates of surface erosion, bank erosion, and channel migration characteristic of those under which the communities developed.

7. Maintain or restore riparian and aquatic habitats necessary to foster the unique genetic fish stocks that evolved within the specific geo-climatic region; and

8. Maintain or restore habitat to support populations of well-distributed native and desired nonnative plant, vertebrate, and invertebrate populations that contribute to the viability of riparian-dependent communities.

Interim Standards and Guidelines

Watershed and Habitat Restoration

WR-1: Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of riparian management objectives.

WR-2: Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed-based coordinated resource management plans (CRMPs) or other cooperative agreements to meet riparian management objectives.

WR-3: Do not use planned restoration as a substitute for preventing habitat degradation (i.e., use planned restoration only to mitigate existing problems, not to mitigate the effects of proposed activities).

Interim Riparian Management Objectives (RMOs)

Interim RMOs apply to streams in watersheds with anadromous fish. Objectives for six habitat features have been identified, including one key feature (kf) and five supporting features (sf). These features are

good indicators of ecosystem health, are quantifiable, and are subject to accurate, repeatable measurements.

Table E-1. Interim RMOs by habitat feature

Habitat Feature	Interim Objectives
Large Woody Debris (sf) (forested systems)	East of Cascade Crest in Oregon, Washington and Idaho: >20 pieces per mile; >12 inch diameter; >35 foot length
Bank Stability (sf) (non-forested systems)	>80 percent stable
Lower Bank Angle (sf) (non-forested systems)	>75 percent of banks with <90 degree angle (i.e., undercut)
Width/Depth Ratio (sf) (all systems)	<10, mean wetted with divided by mean depth

All of the described features may not occur in a specific segment of stream within a watershed, but all generally should occur at the watershed scale for stream systems of moderate to large size (3rd to 7th order).

Interim RMOs may be modified to better reflect conditions that are attainable in a specific watershed or stream reach based on local geology, topography, climate, and potential vegetation. Generally, RMO modifications would require completion of watershed analysis to provide the ecological basis for the change. However, RMOs may be modified in the absence of watershed analysis where watershed or stream reach-specific data support the change. In all cases, RMO modifications, the rationale supporting those changes, and the effects of the changes would be documented. Within the range of listed salmon, modification of RMOs would be done in consultation with NOAA-NMFS.

The interim RMOs for stream channel conditions provide the criteria against which attainment, or progress toward attainment, of the riparian goals is measured. Interim RMOs provide the target toward which managers would be aiming as they conduct resource management activities across the landscape. However, interim RMOs are not to establish a ceiling for what constitutes good habitat conditions. Actions that reduce habitat quality, whether existing conditions are better or worse than objective values, are inconsistent with the purpose of this interim direction. Without the benchmark provided by measurable RMOs, habitat suffers continual erosion. As indicated parenthetically above, some of the objectives apply to forested ecosystems only, some to non-forested ecosystems, and some to all ecosystems regardless of whether or not they are forested.

Application of the interim RMOs requires thorough analysis. That is, if the objective for an important feature such as pool frequency is met or exceeded, there may be some latitude in assessing the importance of the objectives for other features that contribute to good habitat conditions. For example, in headwater steelhead streams with an abundance of pools created by large boulders, fewer pieces of large wood might still constitute good habitat. The goal is to achieve a high level of habitat diversity and complexity, through a combination of habitat features, to meet the life-history requirements of the anadromous fish community inhabiting a watershed.